

The Future of Site Productivity Estimates

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Panel Discussion – Jim Arney, Nick Crookston, Jim Goudie, Bob Monserud

Jim Arney submits:

What is Site Index?

- 1) A continuous variable used as an index to growth and yield capacity
- 2) Direct measurement of total yield is not practical (water displacement!)
- 3) Therefore, use a parameter highly correlated with yield; and, minimally correlated with other confounding factors. We have chosen Total Tree Height.

Method?

Observe total height at a specified age in years:

Traditionally – 100 years total age

Western America – 50 years at breast height

Southern U.S. – 25 years total age

Range of Application of one Site Curve equation? (consider King (1966) Douglas-fir)

10 – 50 million acres (4 – 20 million hectares)

Does it work? Yes

Is it Adequate? No

Confounding Factors:

Early suppression from overtopping trees – reduces height growth

Early site preparation, brush and animal control – enhances height growth

Observe – highly variable # years to attain a height of 6 meters (20 feet)

Alternatives?

Use Height instead of Age as the index reference point !

Use Boris Zeide's (May, 1978) Journal of Forestry – Two-point principal

(Remember 1999 Western Mensurationist – Favorite Papers from Jim Arney?)

- 1) Visualize typical sigmoid height / age trend of a site curve
- 2) Select two heights at 10 meters and 20 meters (34 feet and 67 feet)
- 3) Record the # of years to grow from 10 to 20 meter height
- 4) **Site Class** equals 100 divided by # of years (Growth in meters / decade)
- 5) Record the # of years to grow from 20 to 30 meter height
- 6) **Site Shape** equals (#years 10-20 meters) / (#years 20-30 meters)
- 7) Record the # of years to grow from 0 to 10 meter height as silviculture effects

Method?

Use destructive sampling to obtain measurements from sample of trees / species.

Select sample locations based on soil type, soil depth, annual precipitation, solar radiation (average August & September), and elevation.

Sample location stratification based on 200 – 500 K acres (80 – 200 K hectares)